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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,047	07/24/2003	Yoshikazu Kato	112857-412	4039
29175 K&L Gates LLP P. O. BOX 1135 CHICAGO, IL 60690	7590 05/27/2009		<div>EXAMINER</div> <div>CHU, HELEN OK</div>	
			<div>ART UNIT</div> <div>1795</div>	<div>PAPER NUMBER</div>
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/628,047

**Applicant(s)**

KATO ET AL.

**Examiner**

Helen O. Chu

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 4-9, 12-16 and 19-24 is/are pending in the application.
- 4a) Of the above claim(s) 4-8, 12-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 9, and 19-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. The Applicants' amendments have been received on February 9, 2009. Claims 1, 9, 19, 20, 22, 23 have been amended. Claims 3 and 11 have been cancelled.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1, 9, 19-24 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for "the content of the carbon material ranges from about 5 wt% to about 12wt%", does not reasonably provide enablement for "the content of the carbon ranges from 5 wt% to 12 wt%". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. Specifically, Page 7 last paragraph discloses "about 5 wt % to about 12 wt%," nothing the specification limits this range to "5wt% to 12wt%" as it is newly amended. Appropriate corrections are required.

5. The rejections under 35 U.S.C 112, first paragraph, on claims 19 and 22 as failing to comply with the written description requirement have been cancelled, however,

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the rejection under 35 U.S.C 112, first paragraph, on claims 19 and 22 because the specification does not reasonably provide enablement is maintained

6. Claims 19 and 22 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for SBR to PAA of mass ratio 2:2.5 or 0.8:1 or SBR to PAA 2 to 2.5 or 4:1 does not reasonably provide enablement for about 0.8:1 to about 4:1. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. Specifically, the Tables 1 and 2 only indicates two points for SBR to PAA. The Specification does not disclose such a range limitation and Tables 1 and 2 does not illustrates points such as 0.9:1, 1.1:1, 1.2:1 etc. and therefore does not reasonable provide enablement for such ratios. Appropriate corrections or further clarification is required.

7. The rejections under 35 U.S.C 112, second paragraph, on claims 19 and 22 to particularly point out and distinctly claim the subject matter which applicant regards as the invention have been cancelled because Applicants amended the claims.

8. The rejections under 35 U.S.C 112, second paragraph, on claims 20 and 23 to particularly point out and distinctly claim the subject matter which applicant regards as the invention have been cancelled because Applicants amended the claims

9. The rejections under 35 U.S.C 112, second paragraph, on claims 21 and 23 to particularly point out and distinctly claim the subject matter which applicant regards as the invention have been cancelled because Applicants amended the claims

10. Claims depending from claims rejected under 35 U.S.C 112, first paragraph are also rejected for the same.

***Claim Rejections - 35 USC § 103***

11. The rejections under 35 U.S.C 103(a) as being unpatentable over Yamada et al., US 6,632,566 in view of Yoshino et al., on claims are 1, 3, 9, 11, 19-24 maintained. The rejection is repeated below to convenience

12. The rejections under 35 U.S.C 103(a) as being unpatentable over Yamada et al., US 6,632,566 in view of Yoshino et al., on claims are 3, 11 are withdrawn because the Applicants amended the claims. The rejection is repeated below to convenience

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1, 9, 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al., US 6,632,566 in view of Yoshino et al., US 5,631,100.

Yamada teaches a nonaqueous electrolyte secondary battery comprising a positive electrode containing a  $\text{Li}_x\text{M}_y\text{PO}_4$  compound (abstract). The  $\text{Li}_x\text{M}_y\text{PO}_4$  compound has an olivine structure and M is at least one of 3d transition metals (5:14-20). Yamada teaches a specific example wherein M is Fe (iron) at column 6, lines 5-38. The battery further comprises a negative electrode and electrolyte (4:46-55). As a

binder contained in the positive electrode active material, any suitable known resin material, routinely used as a binder for a layer of the positive electrode active material of this sort of nonaqueous battery, may be used (6:41-45).

Yamada does not explicitly teach a binder comprising a styrene butadiene latex adhesive and a polyacrylic acid thickener but discloses that any known suitable binder can be used (7:35-40).

The Yoshino teaches a secondary battery comprising a lithium-containing composite metal oxide cathode active material, a negative electrode and an electrolyte (abstract). The cathode active mixture contains 0.1-20 pbw, preferably 0.5-10 pbw of a binder material based on 100 pbw of the electrode active material. The binder preferably comprises styrene-butadiene latex (7:6-14). When a water-soluble polymer, such as styrene-butadiene latex is used as a binder, a water-soluble thickener may be added as an additive thereto in an amount of 2-60 pbw per 100 pbw of the solid value of the styrene-butadiene latex. Examples of water-soluble thickeners are polyacrylic acid, carboxymethylcellulose and methyl cellulose (8:8-17). The total binder amount is 0.5-10 pbw of 100 active material. The battery exhibits a high voltage operative at a voltage of from 2.6 to 3.5 V (12:10-40).

The Yoshino reference discloses that carbonaceous material can have high capacity and excellent cycle characteristics (3-4:55-10). The Yoshino reference further discloses cathode may contain 4.76 wt% carbon material based on the total active material but the Yoshino reference does not specifically disclose 5 pbw of carbon material (graphite + acetylene black) to 100 pbw of positive active material (Examples).

It is the Examiner's position that the amounts in question are so close that it is a prima facie obvious that one skilled in the art would have expected them to have the same properties *Titanium Metals Corp. v. Banner*, 227 USPQ 773.

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use the known binder of Yoshino for the positive electrode binder of Yamada. Yamada teaches as a binder contained in the positive electrode active material, any suitable known resin material, routinely used as a binder for a layer of the positive electrode active material of this sort of nonaqueous battery, may be used (6:41-45). Yoshino is directed toward nonaqueous batteries with positive electrode binders containing a carbonaceous material, styrene butadiene latex adhesive and a thickener such as polyacrylic acid.

### ***Response to Arguments***

15. Applicant's arguments filed 8/4/2008 have been fully considered but they are not persuasive.

Applicants' principal arguments are:

A) The Applicants arguments for claims 19 and 22 are not persuasive because the mass ratio was illustrated as two ratios and does not demonstrate the ratios in between are included. Therefore, "0.8:1 to 4:1" is rejected under 35 U.S.C 112, first paragraph. Other rejections made on the previous Office Action regarding 35 U.S.C 112, first and second paragraph are withdrawn.

B) The Applicants argues, "In Yamada the only support for adding carbon to the cathode mixture layer can be found .t col. 10 Ins. 11-12, where 25% weight acetylene black is added to  $\text{LiFePO}_4$  with PVDF as a binder. In Yoshino, no discussion is present in the specification for including a conductive agent hat is carbon in the cathode. In Example 1 of Yoshino, a cathode containing a lithium oxide and • pair of carbon agents is disclosed. However, first, that example contains PVDF as a binder with no thickener. Second, the binder is not greater than 2% weight of the cathode mixture layer 2 parts/(100+2.5+2.5+2) total parts = 1.87%). And third, the percent weight of carbon with respect to the total amount of cathode active material and carbon material is 4.76% (5 parts/105 total parts), which is outside the claimed range of 5-12%. Consequently, the combination of Yoshino and Yamada fails to disclose a cathode mixture layer containing olivinic  $\text{LiFePO}_4$ , 2-4% by weight SBR, 0.5-2.5% by weight PAA, and a carbon material as a conducting agent in 5-12% by weight with respect to the cathode active material and the carbon material." It is unclear how Applicants reach this conclusion. The claimed recitations clearly states "carbon material ranges from about 5 wt% to about 12 wt %." Also, the claim recitation clearly states "styrene butadiene latex adhesive in the cathode mixture layer ranges from about 2 wt% to about 4 wt%." In addition, the Applicants admits in the Applicants Arguments/Remarks Page 9 "the range claimed by Applicants provides values of %wt PAA part of which fall outside of the ranges set forth in Yoshino when the values are properly converted to the pbw units described in Yoshino. Admittedly, part of the range falls within the area covered by Yoshino. However, Yoshino describes a thickener amount of between 2 to 60 pbw thickener per



100 pbw PAA. Applicants values when properly converted, shows a thickener range when used with PAA, SBR and olivinic  $\text{LiFePO}_4$  of 12.5 -125 pbw, substantially different from Yoshino's disclosure. Furthermore, Yoshino describes the SBR as between 0.1 to 20 pbw, preferably 0.5-10 pbw. In contrast, Applicants' claimed range is much narrower for the claimed combination of SBR, PAA and olivinic  $\text{LiFePO}_4$ ." That is, the Applicants admit that the Yoshino reference discloses a PAA range that falls within an area of the Applicants claimed range and also, the Yoshino reference also discloses SBR to be broader than the claimed range. The Applicants uses examples conveniently outside of the claimed range to support the Applicants arguments, however, the Yoshino reference discloses "the present invention will be illustrated with reference to Examples, which, however, should not be construed as limiting the present invention (12:40-50)"

C) The Applicants arguments starting at page 9-12 for the weight percentages of SBR and PAA and how it differs from the Applicant's invention. However the arguments do not commensurate with the scope of the claims. It appears the Applicants are arguing dry weight of SBR and PAA; however that is not what was claimed. The Applicants are claiming a weight relationship of SBR and PAA to the active material so despite the calculations that appears to be based on dry weight of SBR and PAA, the Applicants hold no novelty over the prior art. Furthermore, the Examiner never suggested using any value of SBR as part of the calculations, so it appears the Table on page 10 is an error. In page 11, the Applicants appear to have values disclosed by Yoshino to be 12.5-125 pbw thickener per 100bpw binder, the Examiner is confused as how these values were calculated because the Yoshino reference discloses that the

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thickener can have 2-60 pbw of 100 pbw SBR indicating that the thickener must be less than SBR, even at the highest value of the thickener being 60 pbw of SBR, it indicates that the thickener cannot be more than the binder (SBR). That is, Yoshino cannot disclose that the thickener is 125 pbw per 100pbw SBA because the would exceed the values of 2-60 pbw thickener per 100pbw of SBR. The Applicants than argues, results effect variable, however, the Yoshino reference does disclose the claimed ranges of SBR and PAA.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HOC

/PATRICK RYAN/  
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